



Solar Terrestrial Probes

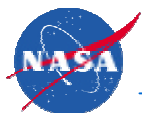
The STP program complements the LWS program. Related missions, along with their goals and objectives, are listed below.

Solar-B

- Probe solar magnetic variability
- Determine how magnetic energy is stored and explosively released to cause flares and coronal mass ejections
- Discover how solar magnetic fields are created and destroyed

STEREO

- Stereo imaging of the Sun; observe coronal mass ejections from birth-to-Earth impact
- Determine the geo-effectiveness of solar mass ejections
- Discover the role of solar mass ejections in generating energetic particles
- Provide a research tool and prototype space weather and early warning system for solar energetic particles





Solar Terrestrial Probes (cont.)

Magnetospheric Multiscale

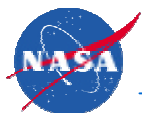
- Investigate the magnetospheric response to coronal mass ejections
- Investigate magnetic reconnection, plasma turbulence, and energetic particle acceleration with five formation-flying smallsats

Geospace Electrodynamics Connections

- Probe the electromagnetic coupling between the Sun and terrestrial upper atmosphere with four formation-flying smallsats

Magnetospheric Constellation

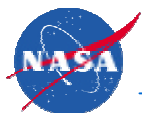
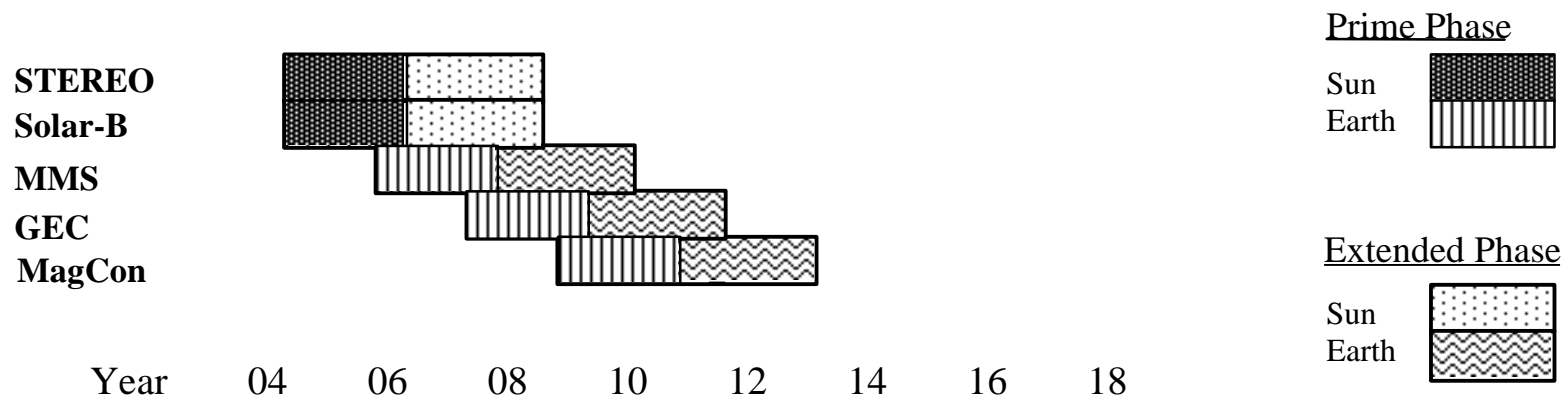
- Probe the dynamics of the geomagnetic tail with a network of 20 to 100 nanosats
- Test magneto-hydrodynamic (MHD) storm theories





Solar Terrestrial Probes (cont.)

Studying the Sun-Earth connected system requires simultaneous observation of interacting regions. Currently, missions have a 2-year design life and have planned launches at 2.5-year intervals. This limits synergism between missions studying different regions of the Sun-Earth system. In order to best complement the LWS program, the STP budget should be augmented to allow a 1.5-year interval between launches and thus enable simultaneous study of key linked regions in the Sun-Earth system. An updated schedule is shown below, illustrating the synergy between the missions with and without an extended mission phase.



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